INDEX

Page

Acetaldehyde content of Jonathan apples, changes in storage 184–186, 190, 191
Acidity, Jonathan apples in storage, determination 189, 191
Aeration, tobacco plants growing in solution cultures, experiments 487–502
Age, physiological, of pea plant, influence on recovery from aphid damage. Cecil D. Harrington and Ed. M. Searls 157–161
Alcohols, effect on swelling and crushing strength of wood, experiments 594–601
Alfalfa—
  fertility problem, discussion 468–471
  fertilization, frequency, relation to production of mature seeds 467–468
  hay, hemicelluloses. Max Phillips and B. L. Davis 775–780
  ovule fertility 455–459, 468–469
  ovules—
    fertile, collapse 465–468, 469
    fertility in relation to position in ovary 460, 470
    pollen-tube growth in ovarian cavity 460–465, 470, 471
  seed—
    formation, partial self-incompatibility and collapse of fertile ovules as factors affecting. D. C. Cooper and R. A. Brink 453–472
    production following self- and cross-pollination 454–455, 469–471
  seeds, mature, production, relation to frequency of fertilization and collapse of fertile ovules 467–468, 469
  self-incompatibility, partial, and collapse of fertile ovules as factors affecting seed formation. D. C. Cooper and R. A. Brink 453–472
Algae—
  blue-green, nitrogen fixation in tobacco nutrient solution, experiments 496–502
  effect on growth of tobacco in relation to aeration, light, and sources of phosphorus. Henry B. Engle and J. E. McMurtrey, Jr 487–502
Alkaline dust diluents, effect on toxicity of rotenone-bearing roots as determined by tests with houseflies. T. C. Allen and J. W. Brooks 839–845
ALLEN, T. C., and BROOKS, J. W.: The Effect of Alkaline Dust Diluents on Toxicity of Rotenone-Bearing Roots as Determined by Tests With Houseflies 839–845
Alsike clover mosaic—
  virus 1—
    symptoms produced on beans 442
    symptoms produced on peas 439–440
  virus 2—
    symptoms produced on beans 442
    symptoms produced on peas 440
Ammonium oxalate solution, use in extracting hemicelluloses from alfalfa hay 776–777
Anaphothrips obscurus, vector in spread of *Aplanobacter stewarti*, tests 679–680
Aplanobacter stewarti—
  insect vectors, studies 661–680
  overwintering 670–671
Apple—
  juice, oxidase activity—
    effect of substrate and its oxidation products on the enzyme 93–95
    measurement by use of ascorbic acid 90–98
  leaf, assimilation as affected by increasing the nitrogen content of nutrient solution, experiments 109–114

Apple—Continued. Page
  propagation by different methods, root responses of noninfectious hairy root seedlings under. E. A. Siegler and J. J. Bowman 739–754
  seedlings, noninfectious hairy root—
    grafts, experiments 742–746, 749–753
    one-year old, experiments 747–748, 749–753
    root cuttings, experiments 746–747, 749–753
    root responses under different methods of propagation. E. A. Siegler and J. J. Bowman 739–754
    trees, young, growth and assimilation, effects of various amounts of nitrogen, potassium, and phosphorus on. L. P. Batjer and E. S. Degman 101–116
Apples—
  Jonathan—
    acetaldehyde content, changes during storage 184–186, 190, 191
    acidity changes during storage 189, 191
    soft scald, physiological study. Erston V. Miller and Harold A. Schomer 183–192
    sugar content, changes during storage 186–188, 190–191
Arsenic—
  soluble, formation by use of lead arsenate sprays, experiments 199–204
  toxicity to sheep, experiments 320–328
ARTSCHWAGER, ERNST: Morphology of the Vegetative Organs of Sugarcane 503–549
Ascorbic acid—
  concentration in plant juices, effect on oxidase activity 91–92
  enzymic versus metallic oxidation, comparative tests 95–96
  hydrogen-ion concentration in plant juices, effect on oxidase activity 90–91
  use as substrate in oxidase measurements. Boyce D. Ezell and Fisk Gerhardt 89–99
ASDELL, S. A., BABCOCK, M. J. BOGART, R., and SPERLING, G.: The Reproductive Efficiency of the Albino Rat Under Different Breeding Conditions 847–853
Aspergillus niger, yield, sporulation, and starch formation, action of some organic compounds on. Robert A. Steinberg 765–773

BABCOCK, M. J., BOGART, R., SPERLING, G., and ASDELL, S. A.: The Reproductive Efficiency of the Albino Rat Under Different Breeding Conditions 847–853
Bacterial wilt—
  of sweet corn, seasonal development, insect vectors, and host range. Charlotte Elliott and F. W. Poos 645–686
  resistance and genetic host-parasite interactions in maize. Ralph E. Lincoln 217–239
BAILEY, BARBARA: Diameter Relationships of Wool Fibers From Five Breeds of Sheep Raised in South Dakota 415–426
Bang's disease—
  control—
    ineffectiveness of proprietary remedies and other drugs, with special reference to "3-V Tonic" and "Bowman's." A. B. Crawford and B. A. Beach 565–574
    use of therapeutic agents 565
  "cures," tests, purpose, procedure, and results 566–574
  nature 566
  remedies, production, Federal control 565–566
Barley—
  Beldi, feeding to range sheep, experiments 41–49

Barley—Continued. Page
brachytic—
and normal strains, chromosome behavior, comparisons 690–691, 699–701
character, inheritance studies 689–709
mutation in, genetic and cytologic studies. S. P. Swenson 687–713
crosses, brachytic gene—
linkage relationships 689–690, 695–699
nature of action 701–708
Himalaya and Brachytic, comparisons 691–694, 701–708
plants, field-grown, comparative size, organs and cells 703–709
seed, natural inoculation with covered smut (*Ustilago hordei*), studies. V. F. Tapke 787–810
Barley seed—
inoculated naturally—
location of inoculum 788–791, 804–806
studies, conclusions 791–792, 804–807
storage methods, relation to smut infection. 799–804
BARR, C. G.: Organic Reserves in the Roots of Bindweed 391–413
BATJER, L. P., and DEGMAN, E. S.: Effects of Various Amounts of Nitrogen, Potassium, and Phosphorus on Growth and Assimilation in Young Apple Trees 101–116
BEACH, B. A., and CRAWFORD, A. B.: Ineffectiveness of Proprietary Remedies and Other Drugs in the Control of Bang's Disease, With Special Reference to "3-V Tonic" and "Bowman's" 565–574
Bean varieties, resistance and susceptibility to three previously undescribed mosaic diseases 442–444
Beans—
infection by mosaic disease of pea, symptoms 441–442
snap—
black root, new virus disease 279–288
new virus disease—
Wilbert A. Jenkins 279–288
description and pathological anatomy 280–284, 287–288
etiology 284
transmission and host range 284–286
BEASLEY, J. O.: Hybridization of American 26-Chromosome and Asiatic 13-Chromosome Species of *Gossypium* 175–181
BENNETT, C. W.: Relation of Food Translocation to Movement of Virus of Tobacco Mosaic 361–390
Benzene, effect on wood, experiments 596, 597
Bicarbonates, salts, effect upon lead arsenate in soil, experiments 200–204
Bindweed roots—
carbohydrate content—
seasonal trends 394–398
trends after crop harvest or cultivation 398–402
nitrogen content, variations 402–405
organic reserves—
at end of season 409–411
effect of sodium chlorate on 406–409
in. C. G. Barr 391–413
BOGART, R., BABCOCK, M. J., SPERLING, G., and ASDELL, S. A.: The Reproductive Efficiency of the Albino Rat Under Different Breeding Conditions 847–853
BONNETT, O. T.: Development of the Staminate and Pistillate Inflorescences of Sweet Corn 25–37
BOTTGER, G. T.: Preliminary Studies of the Nutritive Requirements of the European Corn Borer 249–257
Bovine udder, deterioration in absence of streptococci. E. G. Hastings and E. H. Peterson 145–156
BOWMAN, J. J., and SIEGLER, E. A.: Root Responses of Noninfectious Hairy Root Apple Seedlings Under Different Methods of Propagation 739–754
Bowman's product, use in control of Bang's disease, analysis and experiments 570–573
BRANAMAN, GEORGE A.: Some Factors in Lamb Production Associated With Size and Type in Mutton Sheep 473–486
BRIGGS, H. M., and HELLER, V. G.: The Effect of Adding Blackstrap Molasses to a Lamb-Fattening Ration 65–72

Page
BRINK, R. A., and COOPER, D. C.: Partial Self-Incompatibility and the Collapse of Fertile Ovules as Factors Affecting Seed Formation in Alfalfa 453–472
BROOKS, J. W., and ALLEN, T. C.: The Effect of Alkaline Dust Diluents on Toxicity of Rotenone-Bearing Roots as Determined by Tests With Houseflies 839–845
Brucella abortus, control by proprietary remedies, experiments 565–574
Bunchgrasses—
feed for sheep—
coefficients of digestibility 44–45
digestible nutrients, rating 45–46
feeding to sheep, digestibility experiments 41–49
BURK, EARL F., JONES, LEON K., and VINCENT, C. L.: The Resistance of Progeny of Katahdin Potatoes to Viroses 631–644
BURTON, GLENN W.: A Cytological Study of Some Species in the Genus *Paspalum* 193–197
BYALL, S., WALTON, C. F., JR., and VENTRE, E. K.: Effects of Low Topping and Diastatic Malt Extract on Composition and Quality of Sorgo Sirup 427–432

Carbohydrate content of bindweed roots—
after crop, harvest, or cultivation 398–402
seasonal trends 394–398
Carbonates, effect on lead arsenate in soil, experiments 200–204
Carotene content of soybeans and cowpeas. 141
Carotenoid content—
diploid and tetraploid corn, relation to number of genes per cell. L. F. Randolph and David B. Hand 51–64
of orange rind, distribution 264–265
Casein, protein value, determination, comparison of chemical and biochemical methods 331–341
Cattle, minimum lethal dose of selenium, as sodium selenite, for. W. T. Miller and K. T. Williams 163–173
Chaetocnema—
confinis, agency in spread of *Aplanobacter stewarti* infection 677
denticulata, agency in spread of bacterial wilt of sweet corn, studies 662, 672–676
pulicaria—
agency in spread of bacterial wilt of sweet corn, studies 661–672
infested with *Aplanobacter stewarti*, abundance and distribution 664–670
Chemical—
and biochemical method for determining the biological value of proteins and an evaluation of the endogenous nitrogen, comparison. Floyd C. Olson and Leroy S. Palmer 331–342
attributes of vegetation, effect on forest inflammability. Leon W. Richards 833–838
effect on lead arsenate of certain salts which may be present in soil and spray waters. Joseph M. Ginsburg 199–205
Chemicals, several, effect on swelling and crushing strength of wood. Harvey D. Erickson and Louis W. Rees 593–603
Chickens—
livability tests, precision 761, 762
progeny tests—
efficiency, effect of controlled culling. I. Michael Lerner and Lewis W. Taylor 755–763
precision 758–761, 762
raising, economies due to culling 761, 762, 763
Chloral hydrate, effect on wood, experiments 594–595, 597–599, 600
Chlorides, effect on lead arsenate in soil, experiments 200–204
Chromosome, behavior—
in corn, effect on carotenoid pigments 51–64
in cotton hybrids 175–180
Citrus fruits—
color changes, relation to epinasty, experiments 269–277
normal and decaying, production of epinasty by emanations from. Erston V. Miller, J. R. Winston, and D. F. Fisher. 269–277
Climate, arid and humid, effect on yields of spring wheat and corn 21–22

Page

Coix spp., susceptibility to bacterial wilt, experiments 682, 683, 684
Color changes in—
oranges, relation to epinasty, experiments .. 269–277
sugarcane, occurrence and factors 542–543
Colostrum, chemical composition, determination in study of mastitis 148–153
Compounds, organic—
action on yield, sporulation, and starch formation of *Aspergillus niger*. Robert A. Steinberg 765–773
miscellaneous, effects on *Aspergillus niger*, experiments 765, 768
Concentrates, feed for range sheep, chemical composition 42–43
CONRAD, JOHN P.: Retention by Soils of the Nitrogen of Various Compounds as Shown by Subsequent Plant Response 617–630
COONS, G. H., STEWART, DEWEY, and LAVIS, C. A.: Hybrid Vigor in Sugar Beets 715–738
COOPER, D. C., and BRINK, R. A.: Partial Self-Incompatability and the Collapse of Fertile Ovules as Factors Affecting Seed Formation in Alfalfa 453–472
Corn—
borer, European—
digestive tract, presence of enzymes .. 253–254, 256
mortality, factors affecting 254–257
nutrients affecting survival, weight, and pupation, studies 251–257
nutritive requirements, preliminary studies. G. T. Bottger 249–257
reaction to—
miscellaneous crop plants and weeds .. 255–256
nutrients in various parts of corn plant 255
various vegetable nutrients 254
survival, effect of nutrients 252–253
weights and pupation, effect of nutrients 253
chromosome behavior, effect on carotenoid pigments 52–64
diploid—
carotenoid analyses, results 55–59
carotenoid content, relation to number of genes per cell. L. F. Randolph and David B. Hand 51–64
cell-volume relations 59–63
endosperm—
cell volume, effect of chromosome behavior 59–62
color, chromosome study 56–59, 62–64
gluten meal, protein value, determination, comparison of chemical and biochemical methods 332–341
hybrids, inflorescences, development, studies 26–36
relatives, susceptibility to *Aplanobacter stewarti*, tests 680–684
sweet—
bacterial wilt, seasonal development, insect vectors, and host range. Charlotte Elliott and F. W. Poos 645–686
ear and pistillate spikelet development .. 31–34
flower development, deviations from normal 34–35
inflorescences, staminate and pistillate, development. O. T. Bonnett 25–37
tassel and staminate spikelet development 27–30
tetraploid—
carotenoid analyses, results 55–59
carotenoid content, relation to number of genes per cell. L. F. Randolph and David B. Hand 51–64
cell-volume relations 59–63
whole, protein value, determination, comparison of chemical and biochemical methods 332–341
yields during growing season, effect of amount and distribution of rainfall and evaporation on. Floyd E. Davis and J. E. Pellesen 1–23
See also Maize.

Page

COTTAM, W. P., STEWART, GEORGE, and HUTCHINGS, SELAR S.: Influence of Unrestricted Grazing on Northern Salt Desert Plant Associations in Western Utah 289–316
Cotton, American and Asiatic—
cross-pollination results 175–177
hybridization experiments 175–180
Cotton hybrids—
chromosome behavior, studies 175–180
embryo and endosperm, abnormal development 176–177
production by mixed pollination, experiments 177–179
Cowpeas, vitamin A activity and vitamin B_1 content. J. O. Halverson and F. W. Sherwood 141–144
Cows, mastitis in absence of streptococci, bacteriological study 145–155
CRAWFORD, A. B., and BEACH, B. A.: Ineffectiveness of Proprietary Remedies and Other Drugs in the Control of Bang's Disease, With Special Reference to "3–V Tonic" and "Bowman's" 565–574
Crawford 3–V Tonic, use in control of Bang's disease, analysis and experiments 567–570
Crops, yields, effect of rainfall and evaporation, study by use of Fisher's technique .. 1–22
Cucumber—
crosses—
association of qualitative and quantitative characters 123–124, 126–127
genetic analysis 118–123, 126–127
independent assortment of quantitative characters 124–126, 127
inheritance. A. E. Hutchins 117–128
mosaic virus, movement through rings in stems of *Nicotiana glauca*, experiments .. 379–385
Cucumbers—
flowering, male and female, time, relation to time of fruit maturity 126, 127
fruit maturity, time, relation to time of male and female flowering 126, 127
Curley top virus, movement in *Nicotiana* spp., comparison with mosaic virus 385–387

DAVIS, B. L., and PHILLIPS, MAX: Hemicelluloses of Alfalfa Hay 775–780
DAVIS, FLOYD E., and PALLESEN, J. E.: Effect of the Amount and Distribution of Rainfall and Evaporation During the Growing Season on Yields of Corn and Spring Wheat 1–23
DEGMAN, E. S., and BATJER, L. P.: Effects of Various Amounts of Nitrogen, Potassium, and Phosphorus on Growth and Assimilation in Young Apple Trees 101–116
Desert, northern salt, in western Utah, plant associations, influence of unrestricted grazing on. George Stewart, W. P. Cottam, and Selar S. Hutchings 289–316
Diabrotica duodecimpunctata, vector in spread of *Aplanobacter stewarti* 677
Diameter relationships of wool fibers from five breeds of sheep raised in South Dakota. Barbara Bailey 415–426
Disonycha glabrata, vector in spread of *Aplanobacter stewarti* 677–678
Drugs, ineffectiveness in control of Bang's disease, with special reference to "3–V Tonic," and "Bowman's." A. B. Crawford and B. A. Beach 565–574
Dust diluents, alkaline, effect on toxicity of rotenone-bearing roots as determined by tests with houseflies. T. C. Allen and J. W. Brooks 839–845

Egg, whole dried, protein value, determination, comparison of chemical and biochemical methods 331–341
ELLIOTT, CHARLOTTE, and POOS, F. W.: Seasonal Development, Insect Vectors, and Host Range of Bacterial Wilt of Sweet Corn 645–686

Page

ENGLE, HENRY B., MCMURTREY, J. E., JR.: Effect of Algae in Relation to Aeration, Light, and Sources of Phosphorus on Growth of Tobacco in Solution Cultures.. 487-502
Epinasty, production by emanations from normal and decaying citrus fruits and from *Penicillium digitatum*. Erston V. Miller, J. R. Winston, and D. F. Fisher..... 269-277
Epitrix cucumeris, vector in spread of *Aplanobactor stewarti*, tests..... 678
ERICKSON, HARVEY D., and REES, LOUIS W.: The Effect of Several Chemicals on the Swelling and the Crushing Strength of Wood 593-603
Ethylene—
effect on plastid pigments in rind of oranges..... 263-264, 266
evolution by citrus fruits 276
Euchlaena spp., susceptibility to bacterial wilt, experiments..... 680-681, 684
Evaporation, amount and distribution, effect on yields of corn and spring wheat during growing season. Floyd E. Davis and J. E. Pallesen..... 1-23
Ewes—
fine-wool, breeding efficiency, comparison with crossbred ewes..... 482-484, 485-486
grade western, mated to purebred rams, lambs from, value..... 481-484, 486
Rambouillet, feeding range grasses and mixtures, digestibility experiments .. 41-42
EZELL, BOYCE D., and GERHARDT, FISK: The Use of Ascorbic Acid (Crystalline Vitamin C) as a Substrate in Oxidase Measurements..... 89-99

Fat digestion by lambs, effect of blackstrap molasses in rations..... 67, 68-69
Feeds—
range, digestibility experiments..... 41-49
See also Ration; Rations.
Fertilizers, various amounts, effects on growth and assimilation in young apple trees..... 101-115
Fertilizing, differentially, greenhouse tomatoes, with and without manure, foliar diagnosis. Walter Thomas and Warren B. Mack..... 811-832
Fescue, bluebunch, feeding to livestock, digestibility experiments..... 41-49
Fiber, crude, digestion by lambs, effect of blackstrap molasses in rations..... 67-69
Fibers, wool—
diameter relationships from five breeds of sheep raised in South Dakota. Barbara Bailey..... 415-426
fineness estimation, accuracy of two methods, comparison. Ralph W. Phillips, R. G. Schott, J. I. Hardy, and H. W. Wolf..... 343-349
Fireweed, chemical content, effect on forest inflammability, studies..... 834-838
FISHER, D. F., MILLER, ERSTON V., and WINSTON, J. R.: Production of Epinasty by Emanations From Normal and Decaying Citrus Fruits and From *Penicillium digitatum*..... 269-277
Flax—
rust—
new physiological races—
H. H. Flor..... 575-591
range, collections, and virulence..... 578-580
physiologic races, geographic distribution..... 580-582
varieties—
immunity to rust, factors, discussion... 589-590
new differential—
occurrence..... 575-576
variability in reaction to *Melampsora lini*..... 576-580
reaction to physiologic races of rust..... 582-590
rust-immune, production study..... 575-591
susceptibility to new races of rust..... 575, 578-580, 582-590
FLOR, H. H.: New Physiological Races of Flax Rust..... 575-591

Page

Foliar diagnosis of differentially fertilized greenhouse tomatoes with and without manure. Walter Thomas and Warren B. Mack..... 811-832
Food—
influence on development and survival of saw-toothed grain beetle. Edward L. Thomas and Harold H. Shepard..... 605-615
translocation, relation to movement of virus of tobacco mosaic. C. W. Bennett..... 361-390
Forage crops, feeding to livestock, digestibility experiments..... 41-49
Foremilk, chemical composition, determination in study of mastitis..... 148-153
Forest—
fires, spread, relation to chemical content of vegetation..... 833-838
inflammability, effect of certain chemical attributes of vegetation. Leon W. Richards 833-838
vegetation, moisture content, variation, relation to inflammability..... 833-838
Forests, plant deterioration due to unrestricted grazing in western Utah..... 312-313
Frenching, tobacco, distinguishing from thallium toxicity by spectrographic analysis. G. M. Shear and H. D. Ussery..... 129-139
Fruit juices, oxidase activity—
comparative effect of different substrates.. 96-97
factors affecting, tests..... 90-98
Fruits, citrus, normal and decaying, emanations, production of epinasty. Erston V. Miller, J. R. Winston, and D. F. Fisher... 269-277
Fungus, near-wilt, relation to the pea plant. W. J. Virgin and J. C. Walker..... 241-248
Fusarium oxysporum—
cause of near-wilt of pea..... 241, 247
development and effect on host..... 244, 247
penetration into pea seedlings 242-244, 247
spread by seeds from diseased pea plants. 244-247

GERHARDT, FISK, and EZELL, BOYCE D.: The Use of Ascorbic Acid (Crystalline Vitamin C) as a Substrate in Oxidase Measurements..... 89-99
GINSBURG, JOSEPH M.: Chemical Effect on Lead Arsenate of Certain Salts Which May Be Present in Soil and Spray Waters. 199-205
Gossypium, American 26-chromosome species, hybridization with Asiatic 13-chromosome species. J. O. Beasley..... 175-181
Grain beetle, saw-toothed, development—
influence of temperature, moisture, and food on survival, Edward L. Thomas and Harold H. Shepard 605-615
stages and length 608-610
study methods 605-608
Grasses—
chemical content, effect on forest inflammability 834-838
desert, deterioration due to unrestricted grazing in western Utah 300-303, 313-314
range—
characteristics 41
feed for sheep, chemical composition.... 42-43
mature, digestibility when fed alone and with supplements. Ralph McCall .. 39-50
Grazing, unrestricted, influence on northern salt desert plant associations in western Utah. George Stewart, W. P. Cottam, and Selar S. Hutchings..... 289-316
Growth substances, relation to mechanism of action of radiation on plants, further studies. H. R. C. McIlvaine and H. W. Popp..... 207-215

HALVERSON, J. O., and SHERWOOD, F. W.: The Vitamin A Activity and the Vitamin B_1 Content of Soybeans and Cowpeas.... 141-144
HAND, DAVID B., and RANDOLPH, L. F.: Relation Between Carotenoid Content and Number of Genes per Cell in Diploid and Tetraploid Corn..... 51-64
HARDY, J. I., PHILLIPS, RALPH W., SCHOTT, R. G., and WOLF, H. W.: Comparison of the Accuracy of Two Methods of Estimating Fineness of Wool Fibers..... 343-349

Page

HARRINGTON, CECIL D., and SEARLES, ED. M.: Influence of the Physiological Age of the Pea Plant on Its Recovery From Aphid Damage ... 157–161
HASTINGS, E. G., and PETERSON, E. H.: The Deterioration of the Bovine Udder in the Absence of Streptococci ... 145–156
Hay, alfalfa, hemicelluloses. Max Phillips and B. L. Davis ... 775–780
Heifers—
  lactating, udder deterioration, bacteriological studies ... 145–155
  pregnant, infected with *Brucella* organisms, effectiveness of "abortion cures," experiments ... 565–573
HELLER, V. G., and BRIGGS, H. M.: The Effect of Adding Blackstrap Molasses to a Lamb-Fattening Ration ... 65–72
Hemicellulose fraction B, purification and hydrolysis ... 777–779
Hemicelluloses of—
  alfalfa hay—
    Max Phillips and B. L. Davis ... 775–780
    extraction ... 776–777
    isolation ... 777
  wheat straw—
    fractionation and hydrolysis ... 783–785
    isolation and delignification ... 782–783
Hop-sage, deterioration due to unrestricted grazing in western Utah ... 308–310
Horses, minimum lethal dose of selenium, as sodium selenite for. W. T. Miller and K. T. Williams ... 163–173
Houseflies, testing for determination of effect of alkaline dust diluents on toxicity of rotenone-bearing roots. T. C. Allen and J. W. Brooks ... 839–845
HUTCHINGS, SELAR S., STEWART, GEORGE, and COTTAM, W. P.: Influence of Unrestricted Grazing on Northern Salt Desert Plant Associations in Western Utah ... 289–316
HUTCHINS, A. E.: Inheritance in the Cucumber ... 117–128
Hybrid vigor in sugar beets. Dewey Stewart, C. A. Lavis, and G. H. Coons ... 715–738
Hybridization, *Gossypium*, American 26-chromosome and Asiatic 13-chromosome species. J. O. Beasley ... 175–181
Hydrogen-ion concentration of salts, effect on lead arsenate ... 201–202

Illinoia solanifolii, vector in spread of *Aplanobacter stewarti*, tests ... 679
Inflammability, forest, effect of certain chemical attributes of vegetation. Leon W. Richards ... 833–838
Inflorescences, staminate and pistillate, of sweet corn, development. O. T. Bonnett ... 25–37
Inheritance—
  in the cucumber. A. E. Hutchins ... 117–128
  of brachytic character in barley ... 689, 694–699
Inoculation, natural, of seed barley, studies with covered smut (*Ustilago hordei*). V. F. Tapke ... 787–810
Insect vectors of bacterial wilt of sweet corn. Charlotte Elliott and F. W. Poos ... 645–686

JENKINS, WILBERT A.: A New Virus Disease of Snap Beans ... 279–288
JONES, LEON K., VINCENT, C. L., and BURE, EARL F.: The Resistance of Progeny of Katahdin Potatoes to Viroses ... 631–644
Juices, plant, oxidase activity, measurement by use of ascorbic acid ... 90–98

Lamb—
  meat value, measurement in lambs, method ... 476–480
  production, factors associated with size and type in mutton sheep. George A. Branaman ... 473–486
  yield and quality of meat from large and small mutton breeds, comparison ... 479–480
Lambs—
  digestion—
    effects of blackstrap molasses in rations ... 67–70
    efficiency, comparison of groups ... 480–481

Lambs—Continued. Page
  fattening, effect of adding blackstrap molasses to ration. H. M. Briggs and V. G. Heller ... 65–72
  feeding—
    on range, experiments ... 41–49
    range grasses and mixtures, digestibility experiments ... 41–42
  market, production from large and small mutton breeds, feed requirements, comparison ... 474–481
  production from grade western ewes, tests ... 481–484, 486
  purebred, of large and small mutton breeds, tests ... 474–481
  See also Sheep.
LAVIS, C. A., STEWART, DEWEY, and COONS, G. H.: Hybrid Vigor in Sugar Beets ... 715–738
Lead arsenate—
  chemical effect of certain salts which may be present in soil and spray waters. Joseph M. Ginsburg ... 199–205
  decomposition caused by salts in soil and sprays ... 201
  spray residues, toxicity to sheep. J. L. St. John, E. C. McCulloch, J. Sotola, and E. N. Todhunter ... 317–329
  toxicity to sheep. J. L. St. John, E. C. McCulloch, J. Sotola, and E. N. Todhunter ... 317–329
LERNER, I. MICHAEL, and TAYLOR, LEWIS W.: The Effect of Controlled Culling of Chickens on the Efficiency of Progeny Tests ... 755–763
Light—
  effects on root growth of tobacco plants in solution cultures, experiments ... 487–502
  radiation on plants, mechanism of action, relation to growth substances, further studies ... 207–215
Lights, colored, effect on growth of plants, experiments ... 207–215
LINCOLN, RALPH E.: Bacterial Wilt Resistance and Genetic Host-Parasite Interactions in Maize ... 217–239
Linseed cake, feeding to range sheep, digestibility, experiments ... 41–49
Liquids, organic, effect on swelling and crushing strength of wood, experiments ... 595–598
Liver meal, protein value, determination, comparison of chemical and biochemical methods ... 331–341
Livestock, poisoning by selenium, experiments ... 163–173

MACK, WARREN B., and THOMAS, WALTER: Foliar Diagnosis of Differentially Fertilized Greenhouse Tomatoes With and Without Manure ... 811–832
Maize—
  bacterial wilt, resistance and genetic host-parasite interactions in. Ralph E. Lincoln ... 217–239
  inoculation with *Phytomonas stewarti*, virulence studies ... 218–237
  See also Corn.
Malt extract, diastatic, effects on composition and quality of sorgo sirup. C. F. Walton, Jr., E. K. Ventre, and S. Byall ... 427–432
Manure, fertilizing greenhouse tomatoes with and without, foliar diagnosis study. Walter Thomas and Warren B. Mack ... 811–832
Mastitis—
  dairy heifers, investigations ... 147–155
  of cows in absence of streptococci, study ... 145–155
McCALL, RALPH: The Digestibility of Mature Range Grasses and Range Mixtures Fed Alone and With Supplements ... 39–50
McCULLOCH, E. C., ST. JOHN, J. L., SOTOLA, J., and TODHUNTER, E. N.: Toxicity to Sheep of Lead Arsenate and Lead Arsenate Spray Residues ... 317–329
McILVAINE, H. R. C., and POPP, H. W.: Further Studies on Growth Substances in Relation to the Mechanism of the Action of Radiation on Plants ... 207–215

Page

McMURTREY, J. E., JR., and ENGLE, HENRY B.: Effect of Algae in Relation to Aeration, Light, and Sources of Phosphorus on Growth of Tobacco in Solution Cultures.. 487–502
Melampsora lini—
new physiologic races, susceptibility of flax to, study.. 575–591
physiologic races, revised key.. 578
Milk—
catalase content, increase.. 146–152
chlorine content, increase.. 146–152
production, effect of mastitis in absence of streptococci.. 153–155
MILLER, ERSTON V.:
and SCHOMER, HAROLD A.: A Physiological Study of Soft Scald in Jonathan Apples.. 183–192
WINSTON, J. R.:
and FISHER, D. F.: Production of Epinasty by Emanations From Normal and Decaying Citrus Fruits and From *Penicillium digitatum*.. 269–277
and SCHOMER, HAROLD A.: Physiological Studies of Plastid Pigments in Rinds of Maturing Oranges.. 259–267
MILLER, W. T., and WILLIAMS, K. T.: Minimum Lethal Dose of Selenium, as Sodium Selenite, for Horses, Mules, Cattle, and Swine.. 163–173
Moisture—
content of forest vegetation, variations, relation to inflammability.. 833–838
influence on development and survival of saw-toothed grain beetle. Edward L. Thomas and Harold H. Shepard.. 605–615
Molasses, blackstrap, adding to a lamb-fattening ration, effect. H. M. Briggs and V. G. Heller.. 65–72
Mosaic—
diseases of pea, three previously undescribed. W. J. Zaumeyer.. 433–452
virus of tobacco, movement in relation to food translocation. C. W. Bennett.. 361–390
Mules, minimum lethal dose of selenium, as sodium selenite, for. W. T. Miller and K. T. Williams.. 163–173
Mutation, brachytic, in barley, genetic and cytologic studies. S. P. Swenson.. 687–713

Nabis ferus, vector in spread of *Aplanobacter stewarti*, tests.. 679
Near-wilt fungus, relation to pea plant. W. J. Virgin and J. C. Walker.. 241–248
Nicotiana—
glauca—
defoliation, effect on movement of mosaic virus, tests.. 368–371, 387–388
mosaic virus in, acropetal and basipetal movement.. 364–365, 386–388
stem tissues, resistance to passage of mosaic virus, experiments.. 378–385
spp., mosaic virus movement, relation to food translocation.. 361–389
tabacum—
defoliation, effect on movement of mosaic virus, tests.. 367–368, 387–388
mosaic virus in, acropetal and basipetal movement.. 363–364, 386–388
stem tissues, resistance to passage of mosaic virus, experiments.. 377–378
Nitrogen—
balance studies with rats on proteins.. 332–333
balances, range sheep.. 46–48
content of bindweed roots, variations.. 402–405
endogenous, evaluation, with comparison of chemical and biochemical methods for determining biological value of proteins. Floyd C. Olson and Leroy S. Palmer.. 331–342
fixation by blue-green algae in tobacco nutrient solution, experiments.. 496–502
free extract digestion by lambs, effect of blackstrap molasses in rations.. 67, 69–70
of various compounds, retention by soils as shown by subsequent plant response. John P. Conrad.. 617–630
retention by soils, chemical tests.. 622–627, 628–629
various amounts, effect on growth and assimilation in young apple trees. L. P. Batjer and E. S. Degman.. 101–116

Page

Nostoc muscorum, nitrogen fixation in tobacco nutrient solution, experiments.. 497–502
Nutrition—
dairy heifers, relation to udder deterioration, studies.. 145–155
requirements of European corn borer, preliminary studies. G. T. Bottger.. 249–257

OLSON, FLOYD C., and PALMER, LEROY S.: Comparison of a Chemical and a Biochemical Method for Determining the Biological Value of Proteins and an Evaluation of the Endogenous Nitrogen.. 331–342
Orange rinds—
carotenoid fractions in, distribution.. 264–265
plastid pigments in—
effect of ethylene.. 263–264, 266
progressive changes.. 262–263
Oranges, maturing, plastid pigments in rinds, physiological studies. Erston V. Miller, J. R. Winston, and Harold A. Schomer.. 259–267
Organic—
compounds, action on yield, sporulation, and starch formation of *Aspergillus niger*. Robert A. Steinberg.. 765–773
reserves in the roots of bindweed. C. G. Barr.. 391–413
Oryzaephilus surinamensis, development and survival, influence of temperature, moisture, and food. Edward L. Thomas and Harold H. Shepard.. 605–615
Ovules, fertile, collapse, and partial self-incompatibility as factors affecting seed formation in alfalfa. D. C. Cooper and R. A. Brink.. 453–472
Oxidase activity—
in plant juices, factors affecting.. 90–95, 96–97
measurements by use of ascorbic acid (crystalline vitamin C) as substrate. Boyce D. Ezell and Fisk Gerhardt.. 89–99

PALLESEN, J. E., and DAVIS, FLOYD, E.: Effect of the Amount and Distribution of Rainfall and Evaporation During the Growing Season on Yields of Corn and Spring Wheat.. 1–23
PALMER, LEROY S., and OLSON, FLOYD C.: Comparison of a Chemical and a Biochemical Method for Determining the Biological Value of Proteins and an Evaluation of the Endogenous Nitrogen.. 331–342
Parthenogenesis in *Poa pratensis*, cytology. Fred W. Tinney.. 351–360
Paspalum—
boscianum, cytological study.. 196, 197
ciliatifolium, cytological study.. 196, 197
dilatatum, cytological study.. 193–195, 197
floridanum, cytological study.. 194, 196
genus, cytological study of some species. Glenn W. Burton.. 193–197
malacophyllum, cytological study.. 196, 197
notatum, cytological study.. 196, 197
paniculatum, cytological study.. 195, 197
spp., chromosome numbers, relation to equatorial plate.. 197
urvillei, cytological study.. 196, 197
Pea—
aphid, damage, recovery of plant from, influence of physiological age on. Cecil D. Harrington and Ed. M. Searls.. 157–161
mosaic—
diseases—
symptoms.. 439–440
three previously undescribed. W. J. Zaumeyer.. 433–452
three previously undescribed, hosts.. 444–445
virus 4, symptoms produced—
on beans.. 441–442
on peas.. 439
virus 5, symptoms produced—
on beans.. 442
on peas.. 439
viruses, properties.. 445–450
near-wilt, relation of fungus to plant. W. J. Virgin and J. C. Walker.. 241–248
plant—
behavior, relation to aphid attack.. 159

Pea—Continued. Page
plant continued—
growth stage, correlation with recovery from aphid attack 159–161
physiological age, influence on recovery from aphid damage. Cecil D. Harrington and Ed. M. Searls 157–161
recovery from aphid damage, correlation with growth stage 159–161
seed, transmission of *Fusarium oxysporum* 244–247
seedlings, penetration by near-wilt fungus, *Fusarium oxysporum* 242–244, 247
varieties—
early, midseason, and late, relative recovery from aphid damage 158–159
resistance and susceptibility to three previously undescribed mosaic diseases 440–441
Pecan—
dichogamy, varietal differences 561–562, 563
flowers—
pollen shedding, relation to time of stigma-receptivity, experiments 552–564
stigma-receptivity, relation to time of pollen shedding, experiments 552–564
pollen shedding in some varieties. C. L. Smith and L. D. Romberg 551–564
stigma receptivity in some varieties. C. L. Smith and L. D. Romberg 551–564
Pencillium digitatum—
inoculation of citrus fruits for production of epinasty 270–276
production of epinasty. Erston V. Miller, J. R. Winston, and D. F. Fisher 269–277
PETERSON, E. H., and HASTINGS, E. G.: The Deterioration of the Bovine Udder in the Absence of Streptococci 145–156
Phalacrus sp., vector in spread of *Aplanobacter stewarti*, tests 678
Phenanthrene derivatives, effect on *Aspergillus niger*, experiments 765, 769–772
PHILLIPS, MAX:
and DAVIS, B. L.: Hemicelluloses of Alfalfa Hay 775–780
and WEIHE, H. D.: Hemicelluloses of Wheat Straw 781–786
PHILLIPS, RALPH W., SCHOTT, R. G., HARDY, J. I., and WOLF, H. W.: Comparison of the Accuracy of Two Methods of Estimating Fineness of Wool Fibers 343–349
Phosphates, effect on lead arsenate in soil, experiments 200–204
Phosphorus—
calcium salts of, in nutrient solutions, effect on growth of tobacco 489–494
various amounts, effect on growth and assimilation in young apple trees. L. P. Batjer and E. S. Degman 101–116
Phytomonas stewarti—
mutation in, natural rate, studies 232–235, 236
sexual fusion, experimental tests 235–237
virulence, effect of passage through maize, studies 217–237
Phytophthora capsici—
cause of rot of Winter Queen watermelons. James S. Wiant and C. M. Tucker 73–88
host range and control 85–87
morphology and growth characters 80–82
penetration of watermelons, tests 84–85
taxonomy and temperature relations 82–84
Pigments, plastid, in rinds of maturing oranges, physiological studies. Erston V. Miller, J. R. Winston, and Harold A. Schomer 259–267
Pine, red, wood, swelling and crushing strength, effect of several chemicals on, experiments 594–601
Plant—
associations—
deterioration, evidence in western Utah 300–313
northern salt desert in western Utah, influence of unrestricted grazing on. George Stewart, W. P. Cottam, and Selar S. Hutchings 289–316
juices, oxidase activity, measurement by use of ascorbic acid 90–98
products, oxidase activity, comparative effect of different substrates 96–97

Plants— Page
desert, of western Utah, root penetration 299–300
growth—
due to retention by soils of nitrogen of various compounds 619–622
substances, relation to mechanism of action of radiation, further studies. H. R. C. McIlvaine and H. W. Popp 207–215
poisonous to livestock, toxic dosage of selenium in, experiments 163–173
response to nitrogen retention by soils. John P. Conrad 617–630
Plastid pigments in rinds of maturing oranges, physiological studies. Erston V. Miller, J. R. Winston, and Harold A. Schomer 259–267
Poa pratensis, parthenogenesis, cytology. Fred W. Tinney 351–360
Poisoning, livestock, by selenium, experiments 163–173
Pollen shedding in some pecan varieties. C. L. Smith and L. D. Romberg 551–564
POOS, F. W., and ELLIOTT, CHARLOTTE: Seasonal Development, Insect Vectors, and Host Range of Bacterial Wilt of Sweet Corn 645–686
POPP, H. W., and MCILVAINE, H. R. C.: Further Studies on Growth Substances in Relation to the Mechanism of the Action of Radiation on Plants 207–215
Potassium, various amounts, effect on growth and assimilation in young apple trees. L. P. Batjer and E. S. Degman 101–116
Potato—
curly top, susceptibility of Katahdin variety to 637–639
juice, oxidase activity, measurement by use of ascorbic acid 90–98
Katahdin, seedlings, resistance to mechanical and field inoculation with vein-banding virus 635–637
seedlings, disease symptoms, effect of combination of viruses 633–634
varieties, resistance to—
field inoculation with vein-banding virus 637
tobacco mosaic 639–641
Potatoes, Katahdin—
progeny, resistance to viroses. Leon K. Jones, C. L. Vincent, and Earl F. Burk 631–644
resistance to—
curly top 637–639
latent mosaic 641–643
vein-banding 631–637
Protein digestion by lambs, effect of blackstrap molasses in rations 67–68
Proteins, biological value, determination by chemical and biochemical method, comparison, and evaluation of endogenous nitrogen. Floyd C. Olson and Leroy S. Palmer 331–342
Pullets, culling, control, effect on efficiency, progeny tests 756–763
Pyrogallol, effect on wood, experiments 594–595, 599, 600–601
Radiation on plants, mechanism of action, relation to growth substances, further studies. H. R. C. McIlvaine and H. W. Popp 207–215
Rainfall—
amount and distribution, effect on yields of corn and spring wheat during growing season. Floyd E. Davis and J. E. Pallesen 1–23
effect on yields of corn and spring wheat, study by application of Fisher's technique 1–22
Rams, of different size and breed, efficiency for siring market grade lambs in Central States 481–484, 486
RANDOLPH, L. F., and HAND, DAVID B.: Relation Between Carotenoid Content and Number of Genes Per Cell in Diploid and Tetraploid Corn 51–64

Page

Range—
deterioration, intensive study ... 289–315
grasses. *See* Grasses, range.
mixtures—
digestibility when fed alone and with supplements. Ralph M. McCall ... 39–50
feed for sheep—
chemical composition ... 42–43
coefficients of digestibility ... 44–45
digestible nutrient rating ... 45–46
Rat, albino, reproductive efficiency under different breeding conditions, M. J. Babcock, R. Bogart, G. Sperling, and S. A. Asdell ... 847–853
Ration, lamb-fattening, effect of adding blackstrap molasses. H. M. Briggs and V. G. Heller ... 65–72
Rations, mixed, feed for range sheep, chemical composition ... 42–43
Rats, nitrogen-balance studies with proteins ... 332–333
REES, LOUIS W., and ERICKSON, HARVEY D.: The Effect of Several Chemicals on the Swelling and the Crushing Strength of Wood ... 593–603
Remedies, proprietary, ineffectiveness in control of Bang's disease, with special reference to "3-V Tonic" and "Bowman's". A. B. Crawford and B. A. Beach ... 565–574
Reproduction, in albino rat, efficiency under different breeding conditions. M. J. Babcock, R. Bogart, G. Sperling, and S. A. Asdell ... 847–853
Reserves, organic, in the roots of bindweed. C. G. Barr ... 391–413
Resorcinol, effect on wood, experiments ... 594–595, 599, 600–601
RICHARDS, LEON W.: Effect of Certain Chemical Attributes of Vegetation on Forest Inflammability ... 833–838
ROMBERG, L. D., and SMITH, C. L.: Stigma Receptivity and Pollen Shedding in Some Pecan Varieties ... 551–564
Root responses of noninfectious hairy root apple seedlings under different methods of propagation ... 739–754
Roots—
of bindweed, organic reserves. C. G. Barr ... 391–413
rotenone-bearing, toxicity, effect of alkaline dust diluents, as determined by tests with houseflies. T. C. Allen and J. W. Brooks ... 839–845
Rot, of Winter Queen Watermelons, caused by *Phytophthora capsici*. James S. Wiant and C. M. Tucker ... 73–88
Rotenone-bearing roots, toxicity, effect of alkaline dust diluents on, as determined by tests with houseflies. T. C. Allen and J. W. Brooks ... 839–845
Rust of flax, new physiological races. H. H. Flor ... 575–591

Sagebrush, deterioration due to unrestricted grazing in western Utah ... 310–312
ST. JOHN, J. L., MCCULLOCH, E. C., SOTOLA, J., and TODHUNTER, E. N.: Toxicity to Sheep of Lead Arsenate and Lead Arsenate Spray Residues ... 317–329
Salt—
concentrations in soil and sprays, increased, effect upon lead arsenate ... 203–204
desert, northern, in western Utah, plant associations, influence of unrestricted grazing on. George Stewart, W. P. Cottam, and Selar S. Hutchings ... 289–316
Salts—
in soil and spray waters, chemical effect on lead arsenate. Joseph M. Ginsburg ... 199–205
soluble, hydrogen-ion concentration, effect on lead arsenate ... 201–202
SCHOMER, HAROLD A., and MILLER, ERSTON V.:
A Physiological Study of Soft Scald in Jonathan Apples ... 183–192
and WINSTON, J. R.: Physiological Studies of Plastid Pigments in Rinds of Maturing Oranges ... 259–267

Page

SCHOTT, R. G., PHILLIPS, RALPH W., HARDY, J. I., and WOLF, H. W.: Comparison of the Accuracy of Two Methods of Estimating Fineness of Wool Fibers ... 343–349
SEARLES, ED. M., and HARRINGTON, CECIL D.: Influence of the Physiological Age of the Pea Plant on Its Recovery From Aphid Damage ... 157–161
Seed formation in alfalfa, partial self-incompatability and collapse of fertile ovules as factors affecting. D. C. Cooper and R. A. Brink ... 453–472
Selenium, minimum lethal dose, as sodium selenite, for horses, mules, cattle, and swine. W. T. Miller and K. T. Williams ... 163–173
Shadscale, deterioration due to unrestricted grazing in western Utah ... 303–305
SHEAR, G. M., and USSERY, H. D.: Trenching of Tobacco Distinguished From Thallium Toxicity by Spectrographic Analysis ... 129–139
Sheep—
digestion efficiency, comparison of groups ... 480–481
feeding on range, experiments ... 41–49
five breeds raised in South Dakota, diameter relationships of wool fibers from. Barbara Bailey ... 415–426
mutton, size and type, association with some factors in lamb production. George A. Branaman ... 473–486
range—
feed consumption, digestion studies ... 43–44
nitrogen balances ... 46–48
toxicity to of lead arsenate and lead arsenate spray residues. J. L. St. John, E. C. McCulloch, J. Sotola, and E. N. Todhunter ... 317–329
See also Ewes; Lambs.
SHEPARD, HAROLD H., and THOMAS, EDWARD L.: The Influence of Temperature, Moisture, and Food Upon the Development and Survival of the Saw-Toothed Grain Beetle ... 605–615
SHERWOOD, F. W., and HALVERSON, J. O.: The Vitamin A Activity and the Vitamin B_1 Content of Soybeans and Cowpeas ... 141–144
Shrubs, chemical content, effect on forest inflammability ... 834–838
SIEGLER, E. A., and BOWMAN, J. J.: Root Responses of Noninfectious Hairy Root Apple Seedlings Under Different Methods of Propagation ... 739–754
Silicates, effect upon lead arsenate in soil, experiments ... 200–204
Sirup, sorgo, composition and quality, effect of low topping and diastatic malt extract on. C. F. Walton, Jr., E. K. Ventre, and S. Byall ... 427–432
SMITH, C. L., and ROMBERG, L. D.: Stigma Receptivity and Pollen Shedding in Some Pecan Varieties ... 551–564
Smut, covered—
dissemination in winter barley, experiments at Arlington, Va ... 795–799, 805
natural inoculation of seed barley with, studies. V. F. Tapke ... 787–810
of barley, types of emergence and relation to spore dissemination and seed inoculation ... 792–795, 805
spore dissemination, effects of periods on infection of barley ... 799–804
Sodium—
chlorate, effect on organic reserves in bindweed ... 406–409
selenite, minimum lethal dose for horses, mules, cattle, and swine. W. T. Miller and K. T. Williams ... 163–173
Soft scald in Jonathan apples, physiological study. Erston V. Miller and Harold A. Schomer ... 183–192
Soil water, salts present, chemical effect on lead arsenate. Joseph M. Ginsburg ... 199–205
Soils—
arsenic accumulation by use of lead arsenate sprays, experiments ... 199–204
nitrogen retention, chemical tests ... 622–627, 628–629
of Utah, Pine Valley, description ... 295–299

Soils—Continued. Page
retention of nitrogen of various compounds as shown by subsequent plant response. John P. Conrad 617–630
Sorghums, susceptibility to bacterial wilt, experiments 682–683
Sorgo sirup—
composition and quality, effects of low topping and diastatic malt extract on. C. F. Walton, Jr., E. K. Ventre, and S. Byall 427–432
manufacture, malt-extract method, research 427–432
SOTOLA, J., ST. JOHN, J. L., MCCULLOCH, E. C., and TODHUNTER, E. N.: Toxicity to Sheep of Lead Arsenate and Lead Arsenate Spray Residues 317–329
South Dakota, five breeds of sheep raised in, diameter relationships of wool fibers from. Barbara Bailey 415–426
Soybean meals, protein value, determination, comparison of chemical and biochemical methods 331–341
Soybeans, vitamin A activity and vitamin B_1 content. J. O. Halverson and F. W. Sherwood 141–144
Spectrographic analysis, use in distinguishing frenching of tobacco from thallium toxicity. G. M. Shear and H. D. Ussery 129–139
SPERLING, G., BABCOCK, M. J., BOGART, R., and ASDELL, S. A.: The Reproductive Efficiency of the Albino Rat Under Different Breeding Conditions 847–853
Sporulation of *Aspergillus niger*, action of some organic compounds on. Robert A. Steinberg 765–773
Spray—
residues, lead arsenate, toxicity to sheep. J. L. St. John, E. C. McCulloch, J. Sotola, and E. N. Todhunter 317–329
waters, salts present, chemical effect on lead arsenate. Joseph M. Ginsburg 199–205
Stains, biological, effects of *Aspergillus niger*, experiments 765, 766–768, 771, 772
Starch formation by *Aspergillus niger*, action of some organic compounds on. Robert A. Steinberg 765–773
STEINBERG, ROBERT A.: Action of Some Organic Compounds on Yield, Sporulation, and Starch Formation of *Aspergillus niger* 765–773
STEWART, DEWEY, LAVIS, C. A., and COONS, G. H.: Hybrid Vigor in Sugar Beets 715–738
STEWART, GEORGE, COTTAM, W. P., and HUTCHINGS, SELAR S.: Influence of Unrestricted Grazing on Northern Salt Desert Plant Associations in Western Utah 289–316
Stigma receptivity in some pecan varieties. C. L. Smith and L. D. Romberg 551–564
Stilbus—
apicalis, vector in spread of *Aplanobacter stewarti*, tests 678
viduus, vector in spread of *Aplanobacter stewarti*, tests 678–679
Stirellus bicolor, vector in spread of *Aplanobacter stewarti*, tests 679
Straw, wheat, hemicelluloses. H. D. Weihe and Max Phillips 781–788
Streptococci, absence from deteriorated bovine udder. E. G. Hastings and E. H. Peterson 145–156
Sugar—
beet hybrids—
involving many strains, vigor, studies 725–738
root weight 726
sucrose content 726–272
beet strains—
individual, response when hybridized 727–738
reciprocal crosses, vigor 722–725
beets, hybrid vigor. Dewey Stewart, C. A. Lavis, and G. H. Coons 715–738
content of Jonathan apples, changes in storage 186–188, 190, 191
Sugarcane—
auricles, morphology 538–541
bud, morphology 513–520
characters, stability 541–524
culm, morphology 505–520

Sugarcane—Continued. Page
growth ring, description 511–512
leaf—
epidermal cell structure 523–526
morphology 521–541
sheath, epidermal cell structure 530–531
ligule, morphology 535–537
root band, description 512–513
stalk, morphology 505–520
stem epidermis, structure 509–511
vegetative organs, morphology. Ernst Artschwager 503–549
Sulfides, effect on lead arsenate in soil, experiments 200–204
SWENSON, S. P.: Genetic and Cytologic Studies of a Brachytic Mutation in Barley 687–713
Swine, minimum lethal dose of selenium, as sodium selenite. W. T. Miller and K. T. Williams 163–173

Tankage, protein value, determination, comparison of chemical and biochemical methods 331–341
Tannic acid, effect on wood, experiments 594–595, 597, 601
TAPKE, V. F.: Studies on the Natural Inoculation of Seed Barley With Covered Smut (*Ustilago hordei*) 787–810
TAYLOR, LEWIS W., and LERNER, I. MICHAEL: The Effect of Controlled Culling of Chickens on the Efficiency of Progeny Tests 755–763
Temperature, influence on development and survival of saw-toothed grain beetle. Edward L. Thomas and Harold H. Shepard 605–615
Temperatures, high and low, lethal, effects on saw-toothed grain beetle, experiments 612–614
Thallium toxicity of tobacco, distinguishing from frenching by spectrographic analysis. G. M. Shear and H. D. Ussery 129–139
Thamnotettix nigrifrons, vector in spread of *Aplanobacter stewarti*, tests 679
THOMAS, EDWARD L., and SHEPARD, HAROLD H.: The Influence of Temperature, Moisture, and Food Upon the Development and Survival of the Saw-Toothed Grain Beetle 605–615
THOMAS, WALTER, and MACK, WARREN B.: Foliar Diagnosis of Differentially Fertilized Greenhouse Tomatoes With and Without Manure 811–832
TINNEY, FRED W.: Cytology of Parthenogenesis in *Poa pratensis* 351–360
Tobacco—
defoliation, effect on movement of mosaic virus 367–371, 387–388
frenching, distinguishing from thallium toxicity by spectrographic analysis. G. M. Shear and H. D. Ussery 129–139
growth in solution cultures, effect of algae in relation to aeration, light, and sources of phosphorus. Henry B. Engle and J. E. McMurtrey, Jr. 487–502
mosaic—
resistance of potato varieties to, experiments 639–641
virus movement—
acropetal and basipetal 362–365, 386–388
comparison with curly top virus 385–387
relation to food translocation. C. W. Bennett 361–390
nutrient solution, hydrogen-ion values and reaction 494–496
plants, growth in culture, effect of blue-green algae, experiments 496–502
stem tissues, resistance to passage of mosaic virus 377–385
stems, acropetal and basipetal movement of mosaic virus in 363–365, 386–388
Turkish—
mosaic virus, effect of darkness on movement 371–373, 387–388
mosaic virus movement out of roots, tests 365–367
seed production, effect on movement of mosaic virus, experiments 373–376
See also *Nicotiana tabacum*.

Page

TODHUNTER, E. N., ST. JOHN, J. L., MCCULLOCH, E. C., and SOTOLA, J.: Toxicity to Sheep of Lead Arsenate and Lead Arsenate Spray Residues 317-329

Tomatoes—
fertilized, nutrition—
equilibrium between nitrogen, phosphoric acid, and potash 821-822, 823-827
intensities 821-823, 827-830
greenhouse, differentially fertilized with and without manure, foliar diagnosis. Walter Thomas and Warren B. Mack .. 811-832
leaf sampling, and analytical methods in foliar diagnosis study 812-813

Toxicity—
lead arsenate and lead arsenate spray residues, to sheep. J. L. St. John, E. C. McCulloch, J. Sotola, and E. N. Todhunter 317-329
rotenone-bearing roots, effect of alkaline dust diluents as determined by tests with houseflies. T. C. Allen and J. W. Brooks 839-845

Tripsacum spp., immunity to bacterial wilt, experiments 681

TUCKER, C. M., and WIANT, JAMES S.: A Rot of Winter Queen Watermelons Caused by *Phytophthora capsici* 73-88

Turnips, radiation on, mechanism of action. 208-215

Udder, bovine, deterioration in absence of streptococci. E. G. Hastings and E. H. Peterson 145-156

Ultraviolet radiation on plants, mechanism of action, relation to growth substances, further studies 207-215

USSERY, H. D., and SHEAR, G. M.: Frenching of Tobacco Distinguished From Thallium Toxicity by Spectrographic Analysis. 129-139

Ustilago hordei, natural inoculation of seed barley with, studies. V. F. Tapke 787-810

Utah—
Pine Valley—
climate 292-293
plant deterioration, effect of unrestricted grazing 289-315
Wah Wah Valley—
climate 292-293
plant deterioration, effect of unrestricted grazing 289-315
western, grazing, unrestricted, influence on northern salt desert plant associations. George Stewart, W. P. Cottam, and Selar S. Hutchings 289-316

Vegetable—
juices, oxidase activity—
comparative effect of different substrates. 96-97
factors affecting, experiments 90-98
leaves, epinasty, production by citrus fruits, experiments 270-276
Vegetables, nutritive values to European corn borer, factors affecting 254
Vegetation, chemical attributes, effect on forest inflammability. Leon W. Richards. 833-838
VENTRE, E. K., WALTON, C. F., JR., and BYALL, S.: Effects of Low Topping and Diastatic Malt Extract on Composition and Quality of Sorgo Sirup 427-432
Vigor, hybrid, in sugar beets. Dewey Stewart, C. A. Lavis, and G. H. Coons 715-738
VINCENT, C. L., JONES, LEON K., and BURK, EARL F.: The Resistance of Progeny of Katahdin Potatoes to Viroses 631-644
Violet, visible, radiation on plants, mechanism of action, relation to growth substances, further studies 207-215
VIRGIN, W. J., and WALKER, J. C.: Relation of the Near-Wilt Fungus to the Pea Plant. 241-248
Viroses, resistance of progeny of Katahdin potatoes to. Leon K. Jones, C. L. Vincent, and Earl F. Burk 631-644
Virus—
disease, new, of snap beans. Wilbert A. Jenkins 279-288
mosaic, of tobacco, movement, relation to food translocation. C. W. Bennett 361-390

Page

Vitamin—
A activity of soybeans and cowpeas. J. O. Halverson and F. W. Sherwood 141-144
B_1 content of soybeans and cowpeas. J. O. Halverson and F. W. Sherwood 141-144
C, crystalline, use as substrate in oxidase measurements. Boyce D. Ezell and Fisk Gerhardt 89-99

WALKER, J. C., and VIRGIN, W. J.: Relation of the Near-Wilt Fungus to the Pea Plant. 241-248
WALTON, C. F., JR., VENTRE, E. K., and BYALL, S.: Effects of Low Topping and Diastatic Malt Extract on Composition and Quality of Sorgo Sirup 427-432
Watermelons—
phytophthora rot—
causal organism, study 80-87
control 86-87
occurrence, importance, and symptoms. 75-80
Winter Queen, rot on caused by *Phytophthora capsici*. James S. Wiant and C. M. Tucker 73-88
Weather, effect on yield of corn and spring wheat, study by application of Fisher's technique 1-22
WEIHE, H. D., and PHILLIPS, MAX: Hemicelluloses of Wheat Straw 781-786
Wheat—
gluten, protein value, determination, comparison of chemical and biochemical methods 332-341
spring, yields during growing season, effect of amount and distribution of rainfall and evaporation on. Floyd E. Davis and J. E. Pallesen 1-23
straw, hemicelluloses. H. D. Weihe and Max Phillips 781-786
whole, protein value, determination of chemical and biochemical method 332-341
Wheatgrass, bluebunch, feeding to livestock, digestibility experiments 41-49
WIANT, JAMES S., and TUCKER, C. M.: A Rot of Winter Queen Watermelons Caused by *Phytophthora capsici* 73-88
WILLIAMS, K. T., and MILLER, W. T.: Minimum Lethal Dose of Selenium, as Sodium Selenite, for Horses, Mules, Cattle, and Swine 163-173
Wilt, bacterial—
of sweet corn, seasonal development, insect vectors, and host range. Charlotte Elliott and F. W. Poos 645-686
resistance and genetic host-parasite interactions in maize. Ralph E. Lincoln 217-239
WINSTON, J. R., MILLER, ERSTON V., and FISHER, D. F.: Production of Epinasty by Emanations From Normal and Decaying Citrus Fruits and From *Penicillium digitatum* 269-277
and SCHOMER, HAROLD A.: Physiological Studies of Plastid Pigments in Rinds of Maturing Oranges 259-267
Winterfat-rabbitbrush, deterioration due to unrestricted grazing in western Utah 305-308
WOLF, H. W., PHILLIPS, RALPH W., SCHOTT, R. G., and HARDY, J. I.: Comparison of the Accuracy of Two Methods of Estimating Fineness of Wool Fibers 343-349
Wood—
moisture changes, relation to swelling and crushing strength, experiments 593-601
swelling and crushing strength, effect of several chemicals on. Harvey D. Erickson and Louis W. Rees 593-603
Wool fibers—
diameters—
measurements, methods and analyses... 416-424
relationships from five breeds of sheep raised in South Dakota. Barbara Bailey 415-426
fineness estimation, accuracy of two methods, comparison. Ralph W. Phillips, R. G. Schott, J. I. Hardy, and H. W. Wolf 343-349

ZAUMEYER, W. J.: Three Previously Undescribed Mosaic Diseases of Pea 433-452